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(54) **Rotationally and angularly adjustable tibial cutting guide**

Dreh- und winkelmässig einstellbare tibiale Schneidföhrung

Guidage adjustable rotatif et angulaire de coupe tibial

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(56) References cited:
US-A- 4 736 737 **US-A- 4 952 213**

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Description

This invention relates to an instrumentation for shaping the proximal surface of the tibia. More particularly, an adjustable cutting guide for preparing a proximal tibial surface to receive a prosthesis component.

In replacing a knee joint which has been damaged due to disease or trauma, it is important that the prosthesis used to replace the damaged portion of the joint be properly aligned with respect to the bone to which the prosthesis is fixed. If the tibial surface does not lie in the correct plane, the implanted prosthesis may not properly articulate with the distal femoral prosthesis when the knee joint is reduced and complications can result. Particular problems are encountered when resection of either the medial or lateral tibial surface is required, in that available shaping instruments require sacrificing the entire proximal surface. Rather, the stability of the prosthesis and knee is significantly improved by retaining as much of the proximal surface as possible.

A conventional tibial cutting guide is generally used to resect the proximal tibial surface transversely with respect to the central long axis of the tibia. An example of such a cutting guide can be found in U.S. Patent No. 4,952,213 to Bowman, et al., which discloses using an intramedullary rod placed into the medullary canal to establish a first axis. A rotatable bar extends perpendicularly from and is affixed to the intramedullary rod and is connected to a pivot device, which in turn is connected to a support arm that holds a saw guide against a proximal portion of the tibia bone. The rotation angle of the intramedullary rod determines the medial-lateral inclination of the saw guide and the pivot device determines the anterior-posterior inclination of the saw guide. The rotatable bar is slideable axially along the intramedullary rod to adjust the cut depth of the saw guide. With the saw guide properly positioned in the desired angular orientation, the saw guide is rigidly attached to the tibia bone using retaining pins and the remainder of the apparatus removed. A saw is then inserted in the saw guide and the entire proximal surface resected.

Such conventional tibial cutting guides as described above are limited in that the entire proximal tibial surface is resected and thus sacrificed to remove a deformity in the medial or lateral tibial surface. Moreover, removing excess bone can cause the prosthesis to become unstable, resulting in additional revision surgeries.

The present invention provides instrumentation for resecting a portion of the proximal tibial surface during knee surgery. The instrument comprises a trial base and a guide block having an anterior surface and opposed proximal and distal surfaces, the guide block being adapted for attachment to the base. Means are provided for rotationally aligning the trial base for proper coverage and with respect to the femoral component. Means are further provided for guiding a cutting tool to make a wedge-shaped resection of the tibia to accom-

modate a tibial tray component having a preselected internal distal surface corresponding to that of the resected tibia, the guide means being rotatable about a lateral-medial axis, including means for selectively adjusting the rotational alignment of the guide means about the lateral-medial axis perpendicular to the longitudinal axis of the tibia. Means are also included for connecting the instrument to the tibial trial base.

There appears to be a need for a method and tibial cutting guide enabling a surgeon to isolate a deformity in either the medial or lateral tibial surface and perform a resection while sparing that portion of the proximal tibial surface which is healthy.

An advantage of the present invention is to provide a tibial cutting guide that requires fewer alignment steps, while allowing greater accuracy in resecting the proximal tibia relative to the central long axis of the tibia.

Another advantage of the present invention is a tibial cutting guide that utilizes a tibial trial base to define a reference plane for accurately determining the proper orientation for rotation and coverage of the tibial implant with respect to the longitudinal axis of the tibia.

The invention may be better appreciated by reference to the attached Drawings, which illustrate one or more preferred embodiments, wherein:

FIG. 1 is a perspective view of the tibial cutting guide according to the present invention in an operative position on a human tibia;

FIG. 2 is an exploded perspective view of the tibial cutting guide;

FIG. 3 is a perspective view of the tibial cutting guide and a cutting tool according to the present invention shown in an operative position for resecting a human tibia; and

FIG. 4 is a perspective view showing an implanted tibial tray prosthesis.

Referring to FIGS. 1 and 2, a preferred embodiment of instrumentation for osteotomy of the proximal tibial surface is generally shown at 10, in a representative position on tibia 12. It will be understood that, in the case shown, the tibia 12 has been already resected such that a portion of the proximal surface of tibia bone 12 will be presently removed to shape the tibial surface for later implantation; discussed below. As shown in FIG. 2, the instrument 10 comprises a guide block 14 having an anterior surface 16 and opposed proximal 18 and distal 20 surfaces including an axial opening 22 defined along the longitudinal axis of the tibia 12. The guide block 14 is adapted for attachment to a tibial trial base, generally indicated at 26 including axial aperture 29. Means more specifically detailed herein are provided for locating the proper degree of rotational alignment of trial base 26 with respect to the longitudinal axis 24 of tibia 12 to assure the proper tibial coverage and orientation with the femoral part of the prosthesis. Means are further provided for guiding a cutting tool for making a wedge-shaped resection of tibia 12 to accom-

modate a tibial tray component having a preselected internal distal surface corresponding to that of the resected tibia as will be appreciated below, preferably, the guide means is pivotally mounted to the anterior surface 16 of the guide block 14, while additional means are provided for selectively adjusting the rotational alignment of the guide means with respect to the lateral-medial axis perpendicular to the longitudinal axis of tibia 12. Means are further included for interlocking the instrument 10 to tibial trial base 26.

Referring further to FIG. 2, the guide block 14 has an anterior surface 16 and opposed proximal 18 and distal 20 surfaces including an axial opening 22 defined along the longitudinal axis 24 of the tibia 12. Opening 22 serves as a passageway for interlocking guide block 14 to tibial trial base 26. It will be understood by those skilled in the art that axial opening 22 can be used as a reference for generally locating instrument 10 with respect to the longitudinal axis of tibia 12, however, the guide means is located with reference to the trial base, as will be appreciated by those skilled in the art. Anterior surface 16 further includes ball plunger assembly 38, screw hole 40 and axially-extending post 42, for pivotally mounting the guide means.

FIG. 2 also shows tibial trial base 26 having a plurality of aligning holes 30, femoral runner 28 and axial aperture 29. Alignment pin 31 is inserted through aligning holes 30 and into surface 25 of tibia 12. Femoral runner 28 is slightly wider than guide block 14, allowing the guide block to be seated within the runner such that aperture 29 is aligned with opening 22. Tibial trial stem 78 having internal threads 79 is adapted for attachment to tibial trial base 26, for anchoring the trial base in the medullary canal 24 of the tibia.

As shown in FIGS. 1, 2 and 3 the guide means is pivotally mounted on post 42 extending from anterior surface 16 of guide block 14. The guide means further comprises at least one and preferably a pair of blade slots 44 defined by horizontally-spaced parallel plates 46, so that the guide means can be pivoted on post 42 to resect the medial or lateral surface or both surfaces of tibia 12 in a single procedure without rotating tibial trial base 26. The instrument can be used for primary tibial resection, but the preferred use is for revision surgery resection. A cutting tool, such as an osteotome 88 shown in FIG. 3, is inserted into blade slot 44 for making a wedge-shaped resection of the proximal tibia to accommodate a preselected tibial prosthesis component.

Referring again to FIG. 2, the adjustment means includes ball plunger assembly 38 extending from anterior surface 16 of guide block 14 mating with indents 48 formed in flange 49 of the guide means. As ball plunger assembly 38 engages indents 48, the guide means is releasably locked in one of the five angular positions. Indents 48 act to prevent movement of guide means, unless a certain excess force is applied to overcome the pressure exerted by ball plunger assembly 38 against indents 48. The angular movement of the guide means

varies between 0° and 22° taking into account a medial or lateral resection of tibia 12, i.e., the indents 48 represent angles of -22°, -12°, 0°, 12° and 22°, respectively. These angles are selected to correspond to the predetermined angle of a tibial tray component; however, it will be understood that the angles could be arranged to correspond to the angle of the particular tibial tray component being implanted.

As shown in FIG. 2, guideway 52 is formed in the guide means for locking the guide means in the selected angular position. Threaded screw 50 is inserted through guideway 52 and threaded into screw hole 40 formed in anterior surface 16 of guide block 14. Threaded screw 50 engages flattened surface 54 of the guide means to lock the guide mean at the angular position selected. Other adjustable locking means can be substituted by those skilled in the art.

Alternatively, spacer plate, generally shown at 56 is provided with proximal and distal surfaces 58 and 62, including an axial passage 64 which aligns with aperture 22 of guide block 14. Spacer plate 56 is adapted to be situated over guide block 14 to accommodate the width of the femoral runner of a medium to extra-large tibial trial base.

As shown in FIG. 2, a handle, generally shown at 32, includes opposed proximal 34 and distal 36 ends, wherein the distal end has threaded portion 66 and the proximal end has driver portion 74. The distal 36 end further includes first 68 and second 70 taper. First taper 68 is slightly smaller in diameter than axial opening 22 for insertion through opening 22 of guide block 14. Second taper 70 is slightly smaller in diameter than passage 64 for insertion through the passage of spacer plate 56, as the spacer plate is situated over the guide block when a medium to extra large prosthesis is implanted. A perpendicular cross member 72 is provided through handle 32 to assist the surgeon in rotating the handle when securing and removing it from the cutting guide 10. Handle 32 maintains the guide block 14 and trial base 26 interlocked during the resection procedure.

As shown in FIG. 2, the interlocking means includes trial screw 76, tibia] trial stem 78 and handle 34. Specifically, trial screw 76 includes a flattened surface 80 having groove 82, threaded bore 84 and external threads 86. Flattened surface 80 is adapted to seat within counter bore 27, flush within femoral runner 28 as the trial screw 76 is inserted through axial aperture 29. Groove 82 is adapted to receive driver portion 74 of handle 32. Threaded bore 84 engages threaded portion 66 of the handle and external threads 86 engages internal thread 79 of tibial trial stem 78.

The cutting guide of the present invention may be carried out in the following method which will now be described. The proximal tibial surface is prepared in the manner described in U.S. Patent No. 4,467,801 to Leo A. Whiteside. The proximal surface of a tibia is prepared to receive a proximal tibial prosthesis by employing a reamer/alignment guide which is used to internally

locate the central long axis of the tibia and a plateau planer which cooperatively engages a guide handle attached to the reamer/alignment guide to accomplish the primary shaping of the proximal tibial surface. The reamer/alignment guide has a rod portion extending into the interior of the tibial shaft whose central long axis is aligned with the central long axis of the tibia. The guide handle is concentric with that rod portion such that the plateau planer assumes the proper alignment with respect to the central long axis of the tibia such that the proximal tibial surface is shaped relative to that axis in a simple and accurate manner.

Following preparation of the tibia, the appropriate size of tibial trial base 26 is situated on surface 25 of tibia 12 to determine if the surface is sufficiently covered without significant overhang. Trial base 26 is then removed from surface 25 and interlocked to tibial trial stem 78 by inserting driver portion 74 of handle 32 into groove 82 of trial screw 76 and threading the trial screw into threaded bore 79 of the trial stem. With tibial trial stem 78 interlocked to tibial trial base 26, the trial stem is then inserted into tibial canal 24.

Guide block 14 of tibial cutting guide 10 is seated within femoral runner 28 with opening 22 aligned with surface 80 of trial screw 76. In the case where a medium through extra large tibial trial base 26 is used, spacer plate 56 is situated over guide block 14 with passage 64 aligned with axial opening 22. Various widths of spacer plate 56 are used to accommodate the wider femoral runner of medium to extra large tibial trial base 26.

As guide block 14 is situated on tibial trial base 26, first taper 68 is inserted through opening 22. If a medium through extra large tibial trial base is used, second taper 70 is inserted through passage 64 of spacer plate 56. The surgeon holding cross member 72 rotates handle 32, thus threading thread portion 66 into thread bore 84 of trial screw 76, interlocking the handle to guide block 14. Handle 32 remains interlocked to guide block 14 during the resection procedure.

As shown in FIG. 3, the angular alignment of tibial cutting guide 10 is adjusted by pivoting the guide means until ball plunger assembly 38 engages one of the five indents 48. Once the correct angular alignment is selected, threaded screw 50 is tightened against surface 54 to lock the guide means at the desired angle. The guide means can be pivotally adjusted to enable the surgeon to resect a 12° or 22° wedge section from the medial or lateral surface of the tibia.

After angular alignment, the proper degree of rotational alignment of tibial trial base 26 about the longitudinal axis of tibia 12 is retained by inserting at least one alignment pin 31 through alignment holes 30 and into surface 25. Alignment pin 31 is inserted opposite the surface to be resected, such that the pin does not interfere with the cutting tool.

FIG. 3 shows a cutting tool, such as oscillating osteotome 88, inserted in blade slot 44 for making a wedge-shaped medial resection of tibia 12. Tibial cutting guide

10 including tibial trial stem 78 are removed and replaced with the wedge-shaped tibial component 90 as shown in FIG. 4.

Other modifications of the cutting guide and method of the present invention will become apparent to those skilled in the art from an examination of the above specification and drawings.

Claims

1. A cutting guide for osteotomy of the proximal tibial surface during knee surgery comprising guide means for guiding a cutting tool for making a resection of the tibia; and means for selectively adjusting the angular alignment of the guide means with respect to the lateral-medial axis perpendicular to the longitudinal axis of the tibia, characterised in that it further comprises:

a guide block (14) having an anterior surface (16) and opposed proximal (18) and distal (20) surfaces including an axial opening (22) alignable with the longitudinal axis of the tibial canal, the guide block (14) being adapted for attachment to a tibial trial base (26) having an axial aperture (29); location means for locating the proper degree of rotational alignment of the tibial trial base (26) with respect to the longitudinal axis of the tibia to assure the proper coverage and alignment with a mating femoral component; said guide means being adjustable for allowing a wedge-shaped resection of the tibia to be made to accommodate a tibial tray component (90) having a preselected internal distal surface corresponding to that of the resected tibia, the guide means being mountable to the anterior surface (16) of the guide block (14); and means (66,70) for connecting the guide block (14) to the tibial trial base (26) during resection comprising a handle (32) having a central axis with opposed proximal (34) and distal (36) ends, the distal end (36) including means for interlocking the guide block (14) to the tibial trial base (26), such that the handle (32) may remain fixed to the tibial trial base (26) during the resection process.

2. The cutting guide of claim 1 wherein the location means includes the tibial trial base (26) having a plurality of aligning holes (30) formed in the tibial trial base (26), through which at least one alignment pin (31) is insertable into the aligning holes (30) to retain the rotational alignment of the tibial trial base (26) with respect to the longitudinal axis of the tibia.
3. The cutting guide of claim 1 or claim 2 wherein the guide means comprises at least one blade slot (44) formed by a pair of parallel plates (46) separated by

a distance.

4. The cutting guide of claim 3 wherein the guide means comprises a pair of blade shots (44) formed by a pair of parallel plates (46) separated by a distance, the guide means being pivotally mountable to the anterior surface (16) at the guide block (14). 5
5. The cutting guide of any of claims 1 to 4 wherein the interlocking means includes the handle (32) having opposed proximal (34) and distal (36) ends, wherein the distal end (36) of the handle (32) threadedly engages a lock screw (76) to secure the guide block to the tibial trial base (26) such that the handle (32) may remain fixed to the guide block during resection. 10 15
6. The cutting guide of any of claims 1 to 5 wherein the adjusting means comprises a ball plunger assembly (40), a plurality of indents (48) and a threaded screw (50), the ball plunger assembly (40) being formed in the anterior surface (16) of the guide block (14) and being engagable with the indents (48) formed in the guide means to selectively adjust the angular alignment of the guide means with respect to the lateral-medial axis perpendicular to the longitudinal axis of the tibia, the threaded screw (50) being insertable through a guideway (52) formed in the guide means, the threaded screw (50) being adapted to be threaded into the guide block (14) for tightening against the guide means in position with respect to the lateral-medial axis perpendicular to the longitudinal axis of the tibia. 20 25 30
7. The cutting guide of claim 6 wherein the angular alignment of the guide means with respect to the lateral-medial axis perpendicular to the longitudinal axis of the tibia can have an offset of about 0° to 22°. 35 40
8. The cutting guide of any of claims 1 to 7 wherein a spacer plate (56) having opposed proximal (58) and distal (62) surfaces including an axial passage (64) alignable with a longitudinal axis of the tibial canal and adapted to be attached to a medium to extra large size tibial trial base (26) for accommodating the width of the femoral runner (28). 45
9. The cutting guide of any of claims 1 to 8 wherein a tibial trial stem (78) having internal threads (79) is interlocked to the tibial base (26) and the tibial trial stem (78) is anchorable within the tibial canal. 50

Patentansprüche

1. Schneidföhrung für die Osteotomie der proximalen Tibia-Oberfläche während einer Knieoperation, bestehend aus einer Föhrungseinrichtung zum Föhren eines Schneidwerkzeugs, um eine Resek-

tion des Schienbeins vorzunehmen, und aus einer Einrichtung zum wahlweisen Justieren der Winkelausrichtung der Föhrungseinrichtung mit Bezug auf die Lateral-Medial-Achse, die rechtwinklig zur Längsachse des Schienbeins verläuft, dadurch gekennzeichnet, daß die Schneidföhrung des weiteren aufweist:

einen Föhrungsblock (14) mit einer vorderen Oberfläche (16) und gegenüberliegenden proximalen (18) und distalen (20) Oberflächen einschließlich einer axialen ÖfFnung (22), welche mit der Längsachse des Tibia-Kanals ausrichtbar ist, wobei der Föhrungsblock (14) an einer Tibia-Testbasis (26), die eine axiale Apertur (29) besitzt, befestigt werden kann;

eine Festlege-Einrichtung zum Festlegen des korrekten Grades der Drehausrichtung der Tibia-Testbasis (26) mit Bezug auf die Längsachse des Schienbeins, um die korrekte Abdeckung und Ausrichtung mit einem dazu passenden Femoralteil sicherzustellen, wobei die Föhrungseinrichtung justierbar ist, um das Vornehmen einer keilförmigen Resektion des Schienbeins zum Aufnehmen eines schalenartigen Tibia-Einsatzes (90) zu gestatten, der eine vorher ausgewählte innere, distale Oberfläche hat, welche der des resezierten Schienbeins entspricht, und wobei die Föhrungseinrichtung an die vordere Oberfläche (16) des Föhrungsblocks (14) angebracht werden kann, und

eine Einrichtung (66, 70) zum Verbinden des Föhrungsblocks (14) mit der Tibia-Testbasis (26) während der Resektion mit einem Griff (32) mit einer Mittelachse und mit gegenüberliegenden proximalen (34) und distalen (36) Enden, wobei das distale Ende (36) eine Einrichtung zum derartigen Verriegeln des Föhrungsblocks (14) mit der Tibia-Testbasis (26) einschließt, daß der Griff (32) während des Resektionsvorgangs an der Tibia-Testbasis (26) befestigt bleiben kann.

2. Schneidföhrung nach Anspruch 1, dadurch gekennzeichnet, daß die Festlege-Einrichtung die Tibia-Testbasis (26) einschließt, die eine Vielzahl von Ausrichtlöchern (30) aufweist, welche in der Tibia-Testbasis (26) ausgebildet sind, wodurch wenigstens ein Ausrichtungsstift (31) in die Ausrichtlöcher (30) gesteckt werden kann, um die Drehausrichtung der Tibia-Testbasis (26) mit Bezug auf die Längsachse des Schienbeins beizubehalten. 55
3. Schneidföhrung nach Anspruch 1 oder Anspruch 2, dadurch gekennzeichnet, daß die Föhrungseinrich-

tung wenigstens einen Klingenschlitz (44) aufweist, der durch ein Paar von im Abstand voneinander angeordneten, parallelen Platten (46) gebildet ist.

4. Schneidföhrung nach Anspruch 3, dadurch gekennzeichnet, daß die Föhrungseinrichtung ein Paar von Klingenschlitzten (44) aufweist, die durch ein Paar von im Abstand voneinander angeordneten, parallelen Platten (46) gebildet sind, wobei die Föhrungseinrichtung an der vorderen Oberfläche (16) des Föhrungsblocks (14) verschwenkbar angebracht werden kann.
5. Schneidföhrung nach irgendeinem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die Verriegelungs-Einrichtung den Griff (32) mit gegenüberliegenden proximalen (34) und distalen (36) Enden einschließt und daß das distale Ende (36) des Griffs (32) mit einer Feststellschraube (76) in Gewindeeingriff steht, um den Föhrungsblock an der Tibia-Testbasis (26) derart zu befestigen, daß der Griff (32) während der Resektion am Föhrungsblock befestigt bleiben kann.
6. Schneidföhrung nach irgendeinem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß die Justiereinrichtung einen Kugelpfängerkolben-Montageaufbau (40), eine Vielzahl von Einkerbungen (48) und eine Gewindeschraube (50) aufweist, wobei der Kugelpfängerkolben-Montageaufbau (40) in der vorderen Oberfläche (16) des Föhrungsblocks (14) gebildet ist sowie mit den in der Föhrungseinrichtung ausgebildeten Einkerbungen (48) in Eingriff kommen kann, um die Winkelausrichtung der Föhrungseinrichtung mit Bezug auf die Lateral-Medial-Achse wahlweise zu justieren, welche rechtwinklig zur Längsachse des Schienbeins verläuft, wobei die Gewindeschraube (50) in eine in der Föhrungseinrichtung ausgebildete Föhrung (52) gesteckt werden kann und wobei die Gewindeschraube (50) in den Föhrungsblock (14) geschraubt werden kann, um diesen gegen die Föhrungseinrichtung mit Bezug auf die rechtwinklig zur Längsachse des Schienbeins verlaufende Lateral-Medial-Achse an der korrekten Stelle festzuziehen.
7. Schneidföhrung nach Anspruch 6, dadurch gekennzeichnet, daß die Winkelausrichtung der Föhrungseinrichtung mit Bezug auf die rechtwinklig zur Längsachse des Schienbeins verlaufende Lateral-Medial-Achse eine Versetzung von 0° bis 22° aufweisen kann.
8. Schneidföhrung nach irgendeinem der Ansprüche 1 bis 7, gekennzeichnet durch eine Abstandshalteplatte (56), die gegenüberliegende proximale (58) und distale (62) Oberflächen hat, welche einen axialen Durchlaß (64) einschließen, der mit einer Längsachse des Tibia-Kanals ausrichtbar ist, und

die an einer Tibia-Testbasis (26) von mittlerer bis Sondergröße befestigt werden kann, um die Breite des Femoralhauptkanals (28) aufzunehmen.

9. Schneidföhrung nach irgendeinem der Ansprüche 1 bis 8, dadurch gekennzeichnet, daß ein Tibia-Testschaft (78) mit Innengewinde (79) mit der Tibia-Basis (26) verriegelt ist und der Tibia-Testschaft (78) innerhalb des Tibia-Kanals verankert werden kann.

Revendications

1. Guide de coupe pour ostéotomie de la surface tibiale proximale au cours d'une opération de chirurgie du genou, comprenant un dispositif de guidage d'un outil de coupe destiné à effectuer une résection du tibia, et un dispositif d'ajustement sélectif de l'alignement angulaire du dispositif de guidage par rapport à l'axe latéromédial perpendiculaire à l'axe longitudinal du tibia, caractérisé en ce qu'il comporte en outre :

un bloc (14) de guidage ayant une surface antérieure (16) et des surfaces proximale (18) et distale (20) opposées ayant une ouverture axiale (22) qui peut être alignée sur l'axe longitudinal du canal tibial, le bloc de guidage (14) étant destiné à être fixé à une base d'essai tibiale (26) ayant un orifice axial (29), un dispositif de positionnement avec le degré convenable d'alignement en rotation de la base d'essai tibiale (26) par rapport à l'axe longitudinal du tibia de manière que la couverture et l'alignement sur l'alignement fémoral complémentaire soient assurés de manière convenable, le dispositif de guidage étant réglable afin qu'il permette la résection du tibia en forme de coin pour le logement d'un élément de plateau tibial (90) ayant une surface distale interne prédéterminée correspondant à celle du tibia ayant subi la résection, le dispositif de guidage étant destiné à être monté sur la surface antérieure (16) du bloc de guidage (14), et un dispositif (66, 70) de raccordement du bloc de guidage (14) à la base d'essai tibiale (26) pendant la résection, comprenant une poignée (32) ayant un axe central et des extrémités proximale (34) et distale (36) opposées, l'extrémité distale (36) ayant un dispositif permettant la coopération par emboîtement du bloc de guidage (14) et de la base d'essai tibiale (26), si bien que la poignée (32) peut rester fixée à la base d'essai tibiale (26) pendant l'opération de résection.

2. Guide de coupe selon la revendication 1, dans lequel le dispositif de positionnement comprend une base d'essai tibiale (26) ayant plusieurs trous d'alignement (30) formés dans la base d'essai

tibiale (26) et par lesquels une broche d'alignement au moins (31) peut être introduite dans les trous d'alignement (30) de manière que l'alignement en rotation de la base d'essai tibiale (26) par rapport à l'axe longitudinal du tibia soit conservé

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3. Guide de coupe selon la revendication 1 ou 2, dans lequel le dispositif de guidage comporte au moins une fente (44) d'une lame formée par deux plaques parallèles distantes (46).

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4. Guide de coupe selon la revendication 3, dans lequel le dispositif de guidage comporte deux fentes (44) de lame formées par deux plaques parallèles distantes (46), le dispositif de guidage pouvant être monté de manière pivotante sur la surface antérieure (16) du bloc de guidage (14).

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5. Guide de coupe selon l'une quelconque des revendications 1 à 4, dans lequel le dispositif de coopération par emboîtement comprend la poignée (32) qui possède les extrémités proximale (34) et distale (36) opposées, l'extrémité distale (36) de la poignée (32) coopérant par vissage avec une vis de blocage (76) afin que le bloc de guidage soit fixé à la base d'essai tibiale (26) d'une manière telle que la poignée (32) peut rester fixée au bloc de guidage pendant la résection.

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6. Guide de coupe selon l'une quelconque des revendications 1 à 5, dans lequel le dispositif d'ajustement comprend un ensemble (40) à plongeur à bills, plusieurs évidements (48) et une vis (50), l'ensemble (40) à plongeur à bille étant formé à la surface antérieure (16) du bloc de guidage (14) et pouvant coopérer avec les cavités (48) formées dans le dispositif de guidage pour l'ajustement sélectif de l'alignement angulaire du dispositif de guidage par rapport à l'axe latéromédial perpendiculaire à l'axe longitudinal du tibia, la vis (50) pouvant être introduite par un guide (52) formé dans le dispositif de guidage, la vis (50) étant destinée à être vissée dans le bloc de guidage (14) afin qu'elle assure un serrage contre le dispositif de guidage en position par rapport à l'axe latéromédial perpendiculaire à l'axe longitudinal du tibia.

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7. Guide de coupe selon la revendication 6, dans lequel l'alignement angulaire du dispositif de guidage par rapport à l'axe latéromédial perpendiculaire à l'axe longitudinal du tibia peut présenter un décalage compris entre 0 et 22° environ.

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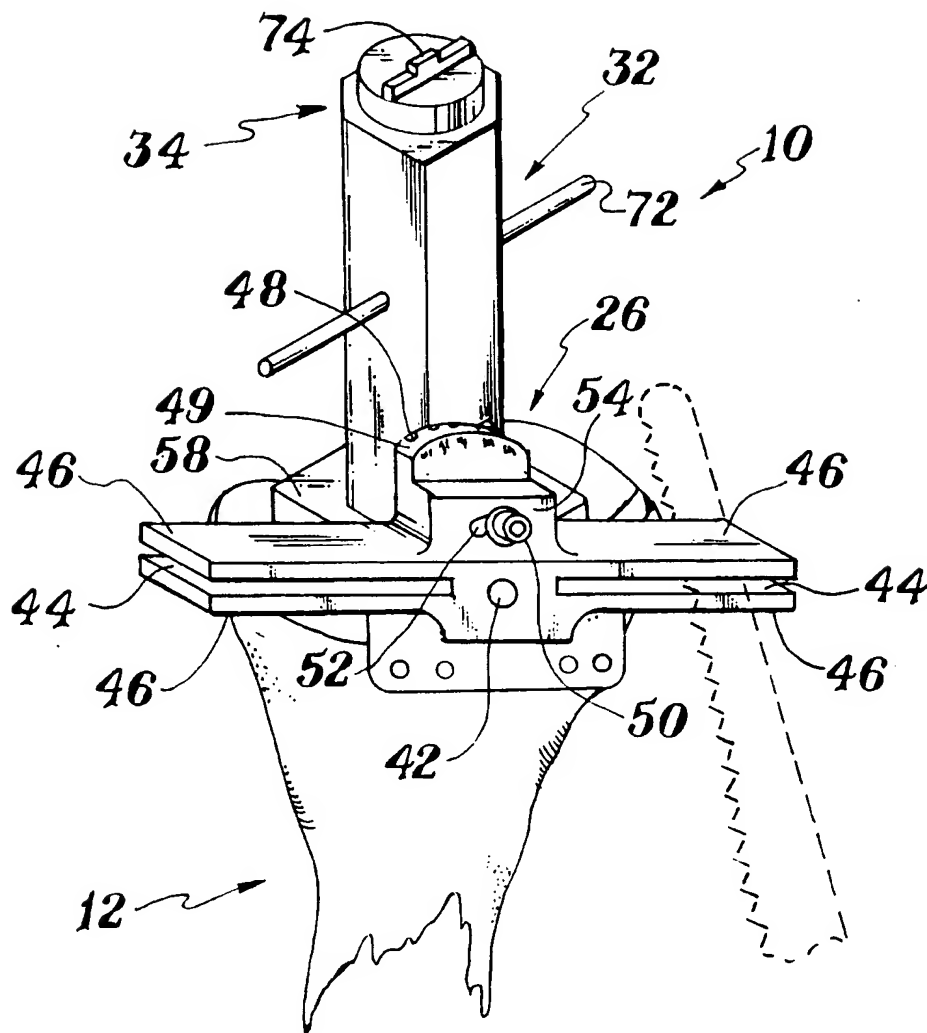
8. Guide de coupe selon l'une quelconque des revendications 1 à 7, dans lequel une place (56) d'entretoise, ayant des surfaces proximale (58) et distale (62) opposées comportant un passage axial (64) qui peut être aligné sur l'axe longitudinal du canal tibial, est destinée à être fixée à une base d'essai

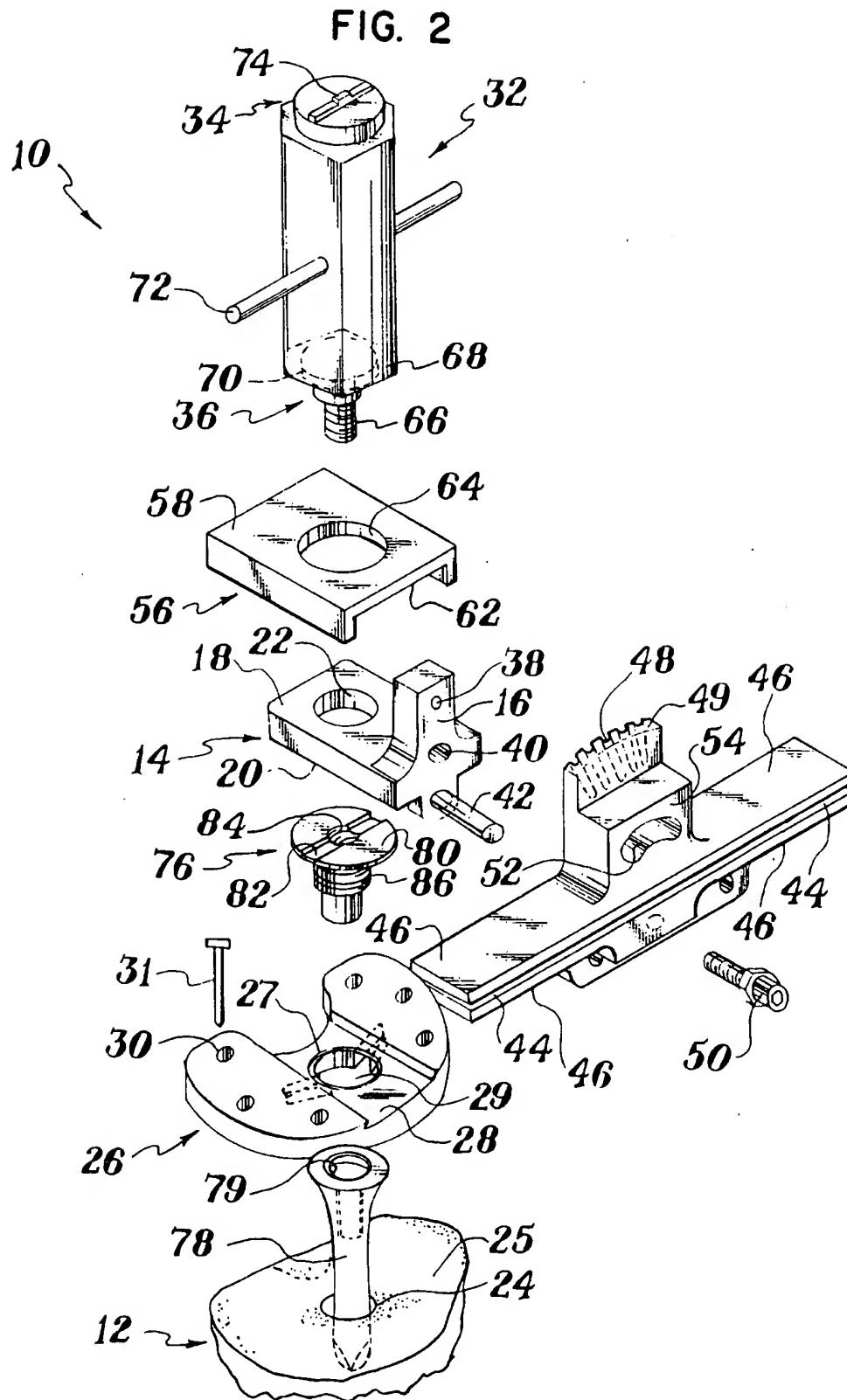
55

tibiale (26) de dimension comprise entre une dimension moyenne et une dimension extrêmement grande permettant la disposition de la largeur de la rigole fémorale (28).

9. Guide de coupe selon l'une quelconque des revendications 1 à 8, dans lequel une tige (78) d'essai tibial ayant un taraudage (79) coopère par emboîtement avec la base tibiale (26), et la tige d'essai tibial (78) peut être fixée dans le canal tibial.

FIG. 1





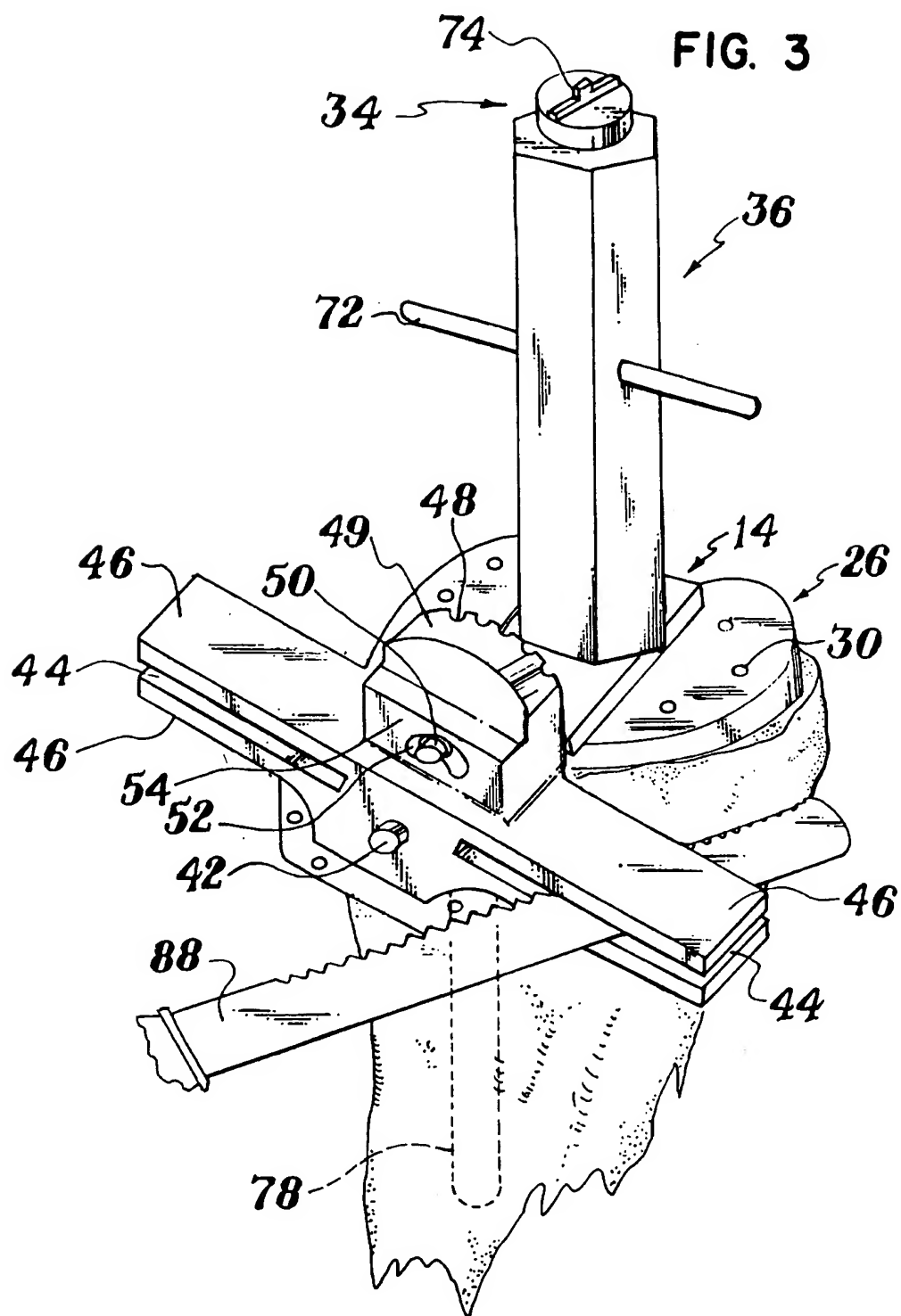


FIG. 4

